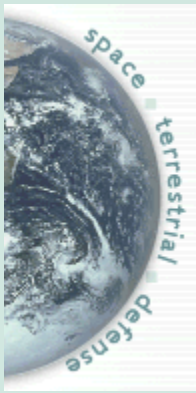

Environmental Sentinels 2005

Invitation ♦ Objectives ♦ Event Program ♦ NASA's Role ♦ Contacts

Co-chaired by NASA's Johnson Space Center (JSC), the Environmental Protection Agency, and the National Technology Transfer Center.

This is one of a continuing series of technology-focused events organized by the Advanced Technology Integration Group (ATIG) at NASA's Johnson Space Center. Learn more online.

Check for new information on the ES 2005 page: http://advtech.jsc.nasa.gov/es05.asp

INVITATION

The ATIG and its co-chairs are pleased to announce Environmental Sentinels (ES) 2005, a two-day technology-focused event on environmental monitoring and control technologies. Join technology developers and potential collaborators from academia, NASA, other government agencies, and the military. Together, we will explore the future of monitoring and control technologies for space, terrestrial, and defense environments.

Event Details

Who: Approximately 100 technology developers and users

What: Small-scale technology-focused event

Where: Houston, Texas (near NASA)

When: Wednesday 6/01 and Thursday 6/02

Why: Learn about current and emerging technologies for environmental monitoring and control; Network with potential collaborators

How: Go to the ES 2005 page to submit your request now; there is **no** registration fee

Call for Speakers

PRESENT YOUR WORK IN TECHNOLOGY DEVELOPMENT OR OPERATIONS

SHARE EMERGING SOLUTIONS OR NEEDS

DESCRIBE COLLABORATIONS SOUGHT OR EXPERTISE OFFERED

READ MORE BELOW

Prospective Participants

We seek approximately equal representation from NASA, the military and other government agencies, and academia. Students earning degrees in related fields and considering a career in this area are welcome to join us.

Call for Speakers

We encourage technology developers and users who are working in the area of environmental monitoring and control technologies and systems to speak at ES 2005. Listed below are types of presentations that we seek:

- a presentation on government technology needs or development programs;
- a more focused presentation on an emerging technology or new application of a current technology; or
- a presentation on team capabilities and achievements or a technology demonstration.

ES 2005 will be a forum for addressing the common needs and requirements of NASA, academia, other government agencies, and the military. Some of the most difficult challenges include (but are **not** limited to):

- adequately and unobtrusively monitoring the crew compartment of a spacecraft or other closed and remote environment,
- detecting minute quantities of contaminants in the homeland or in the battlefield,
- measuring pollutants in the atmosphere and water, and the
- intelligent processing and wireless transmission of such data.

Presentations will last 30 minutes, including question and answer time at the speaker's discretion. With speaker permission, we will record ES 2005 talks and publish them as streaming media. Previous event archives are online, where you can listen to more than 130 streaming media talks on space life sciences technology needs: ATIG Presentation Portal.

> Speakers are responsible for clearing their content in accordance with their organizations' regulations. This event is open to national and international participants.

Request Your Space Now

With limited space and a focus on high-quality networking, ES 2005 is invitation-only. Fill out a short online form to:

- Request your invitation to attend or
- Request your invitation to speak

Once you request an invitation, look for a confirmation email. Confirmed attendees will receive regular schedule updates and other information, including the *Information Pack*. This is a comprehensive guide to travel, directions, parking, and other logistics.

Important Notes

Speakers and participants ***do not pay any registration fees***, but are responsible for their own travel, hotel, and meal costs.

Our events emphasize learning and interaction, which can only take place if we have strong representation from relevant communities. We make every effort to announce events broadly. But in the event that response is low, we reserve the right to cancel or change the date. *We recognize that travel plans must be made in advance, so any changes will be made no less than 30 days before the event.*

OBJECTIVES

NASA is poised on the threshold of a new era in exploration, when plans for a return to the Moon and missions to Mars are being forged. The agency will rely as never before on collaborators in academia and government to bring these plans to fruition. Thus, ES 2005 is an opportunity to learn about and share technology needs in the critical area of environmental monitoring and control.

ES 2005 will focus on advanced technologies for monitoring particulate, chemical, and microbial contaminants in the human environment, be it in a heavily populated urban area, an industrial site, the military theater, or the human-rated systems in the vast reaches of space. Despite different operational scenarios or uses, such monitoring technologies are vital to human health, safety, and performance. The objectives of ES 2005 are to:

- **LEARN** about the unique constraints of space flight and other challenging environments, technology needs for monitoring and control of these environments, and mechanisms for collaboration;
- **COLLABORATE** with like-minded innovators and experts working in technology and operations; establish the connections and relationships that lead to strong collaborations and joint proposals; and
- **EXPLORE** emerging solutions or new applications of current technology that will advance human space flight and safety here on Earth.

The government has invested large sums in technologies, resources, and skill sets—capabilities that might be integrated via collaboration on competitive, peer-reviewed research opportunities in the near future. Leveraging of skills and prior work across the community will contribute to solving a multitude of technology needs for the future.

What ES 2005 Is

ES 2005 will be a small-scale, tightly-focused meeting for approximately 100 participants. It will offer an intimate opportunity to network with technologists, engineers, government program managers, and others who do not otherwise gather together. Much has been accomplished since this event was last held in 2002. We hope to encourage the collaborations that will further advance these technologies.

What ES 2005 Is Not

The purpose of this event is not to present research or experiments, but rather to explore technology approaches and solutions with potential collaborators. We do not use our resources on elaborate facilities, materials, or refreshments. This approach allows us to focus on networking and the content itself.

EVENT PROGRAM

Although the ES 2005 program is still being drafted, plan to join us from approximately 8:30 am to 5:00 pm on both days. Ample networking breaks will be scheduled to allow for lively discussion between potential collaborators.

Check the ES 2005 event page for the updated schedule, which will be posted each Friday: http://advtech.jsc.nasa.gov/es05.asp.

Wednesday June 1

8:30am - 5:00pm

Day 1 will include a plenary session on government programs, specific technology needs, or emerging capabilities with talks by government program managers, scientists, and engineers. Talks will be broad in scope, covering many needs and technologies, rather than reports on a single technology or study.

Thursday June 2

8:30AM - 5:00PM

Day 2 will focus on specific technology solutions now in development and new applications of existing technologies. Talks will be technically detailed and will emphasize where collaborative expertise is needed.

NASA'S ROLE

The Johnson Space Center (JSC) cares for crewmembers before, during, and after a mission. A major component of crew safety and health during a mission is monitoring and control of the closed-loop crew environment. It must be free from contaminants; should contamination occur, they must be instantly identified and localized. The technical needs for spacecraft environmental monitoring technologies are implicitly given at: http://www.jsc.nasa.gov/toxicology/, while advances in life support technologies are described at: http://advlifesupport.jsc.nasa.gov/.

While JSC is responsible for specifying, developing and integrating monitoring technologies and systems for human spacecraft, it relies upon technologies developed by academia, other government agencies, and other NASA Centers under the Advanced Environmental Monitoring and Control program (see http://spaceresearch.nasa.gov/research_projects/ahst.html for details). Therefore, we seek strong representation from all NASA Centers, academia and government who can contribute to this important area.

Likewise, we recognize the common needs of homeland defense, the military, and community safety organizations in the area of environmental monitoring and control. We seek strong representation from these communities, so that we can learn about and contribute to progress in the larger environmental monitoring community. NASA technology needs include:

- **WATER**
  - Measure liquid droplets, dispersed gas bubbles, dissolved gases and ions, and polar organic compounds such as methanol, ethanol, isopropanol, butanol, and acetone
  - Monitor organic and inorganic contaminants in wastewater and throughout the water recycling process
- **AIR**
  - Measure particulate matter (i.e., lunar dust), major constituents (i.e., oxygen, carbon dioxide, and water vapor) and trace gas contaminants (i.e., ammonia, formaldehyde, ethylene)
- **FOOD**
  - Determine the shelf stability of processed food ingredients; identify and control microbial agents of food spoilage, including the development of novel countermeasures to prevent microbial growth in food supplies
  - Monitoring food quality, taste, and nutritional content etc., for food with a shelf life of several years
- **CONTAMINANTS**
  - Monitor and control the chemical and microbial content of the air, food, water, and liquid and solid wastes in an enclosed crew environment
  - Monitor and identify microbial species, especially pathogens, with minimal operator effort and minimal or no reagent usage, including the development of countermeasures to prevent microbial growth
  - Monitor more than one chemical or microbial species at a time
  - Monitor and process solid waste, including stabilization, sterilization, and/or microbial control technologies to minimize or eliminate biological hazards associated with waste; odor abatement technology
  - Inhibit microbial growth on wetted surfaces, including condensate collection surfaces for humidity control and heat exchangers resident in water loops
  - Automatic disinfection technologies
  - Minimize or eliminate biofilm or microbial contamination from water, air, and liquid and solid waste systems
- **SYSTEMS**
  - Intelligent automation for air and water environmental control systems: distributed data management and control, sensor interpretation, planning and scheduling, modeling and simulation, and validation and verification of autonomous control systems
  - Autonomous systems for human exploration missions with situational awareness; ability to change the level of autonomy based on both situation and human input
  - Autonomous control systems that troubleshoot system problems and failures in concert with the crew

For all of the above, NASA needs significant improvements in miniaturization, accuracy, precision, and operational reliability. In addition, the following characteristics are important: long life, real-time, multi-functional, in-line operation, self-calibration, reduction of expendables, low energy consumption, and minimal operator/maintenance time.

CONTACTS

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Event Leads

Please contact us if you have any questions about ES 2005:

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